

## Letter to the Editor

## Assessment of thyroid function in children, adults and pregnant and lactating women after long-term salt iodisation measurements

This letter is regarding the recent publication of 'Assessment of thyroid function in children, adults and pregnant and lactating women after long-term salt iodisation measurements' by Su *et al.*<sup>(1)</sup>. The findings presented by the authors are both relevant and interesting to the iodine research conducted in China. The cross-sectional study covered six different provinces located in the northern, central and southern regions of China; however, some regions such as Xinjiang (northwest region), Qinghai (northwest region) and Yunnan (southwest region) were not included. For example, Xinjiang is classified as iodine excessive region. Overall, the findings by the authors have provided some valuable information especially the use of thyroglobulin (Tg) to assess iodine status in children, adults, pregnant and lactating women living in China.

I would like to highlight the use of Tg by the authors in the assessment of iodine status<sup>(1)</sup>. There are limited data on the use of Tg to assess iodine status in populations with adequate (median urinary iodine concentration (UIC) 100–199 µg/l), above requirements (median UIC 200–299 µg/l) and excessive iodine levels (median UIC ≥300 µg/l)<sup>(2,3)</sup>. Most of the data on Tg as a promising biomarker of iodine status are derived from iodine-deficient population (median UIC <100 µg/l). Therefore, Tg has been proposed to be a useful biomarker to assess iodine deficiency in populations based on these studies.

A median Tg cut-off of <13 µg/l has been proposed to indicate iodine sufficiency in children and possibly in adults<sup>(3,4)</sup>. However, there are no further specific Tg cut-offs to determine the adequate (median UIC 100–199 µg/l), above requirements (median UIC 200–299 µg/l) and excessive iodine levels (median UIC ≥300 µg/l). In this study, Su *et al.* reported that children and adults with a median UIC of 200–299 µg/l had a significantly lower median Tg concentration than children and adults with a median UIC of 100–199 µg/l (children: 2.79 *v.* 2.91 µg/l; adults: 5.56 *v.* 8.12 µg/l), although both groups were considered to have good iodine status and normal thyroid function (i.e. thyroid-stimulating hormone (TSH) and free thyroxine (FT4) of both groups were remained within normal range<sup>(2)</sup>). Therefore, it is suggested that Tg might be a sensitive biomarker to assess iodine sufficiency in populations<sup>(4)</sup>. In addition, Tg is a longer measure term of iodine status than UIC, which is affected by hydration status and high intra-individual variation<sup>(2,4)</sup>. Although Su *et al.* collected three spot urine samples to reduce the intra-individual variation in UIC<sup>(2)</sup>, at least ten spot urine samples are needed to reliably assess individual iodine status using UIC<sup>(5)</sup>. However, even with the collection of multiple spot urine samples (>10), the high intra-individual variation still cannot

be eliminated<sup>(5,6)</sup>. Moreover, there is no consensus on the timing and period of collecting multiple spot urine samples<sup>(5,6)</sup>. It is unclear if an average UIC value obtained from three spot urine samples over a 10-d period could be comparable to the average UIC value from three spot urine samples over 30-d period.

One of the limitations of using Tg to assess iodine status is that Tg can be confounded by the presence of thyroglobulin antibody (TgAb), which can give falsely high or low Tg values<sup>(2)</sup>. Su *et al.* reported that adults had a relatively higher prevalence of TgAb than children (12.4 *v.* 2.8%)<sup>(2)</sup>, suggesting that Tg might not be a suitable to assess iodine status of adult populations because Tg value obtained might be confounded by the presence of TgAb<sup>(3)</sup>. In addition, if the measurement of TgAb is required before the determination of Tg, the additional test of TgAb would increase the cost of using Tg to assess iodine status<sup>(3,4)</sup>. Therefore, if not corrected, this issue will affect future publications that measure Tg in populations.

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Zheng Feei Ma<sup>1,2,3</sup>

<sup>1</sup>Department of Public Health, Xi'an Jiaotong-Liverpool University, 215123 Suzhou, People's Republic of China

<sup>2</sup>School of Medical Sciences, Universiti Sains Malaysia, Kota Bharu, 15200 Kelantan, Malaysia

<sup>3</sup>Health and Sustainability Innovation (HSI) Lab, Health Technologies University Research Centre (HT-URC), Xi'an Jiaotong-Liverpool University, 215123 Suzhou, People's Republic of China

email Zhengfee.Ma@xjtlu.edu.cn

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